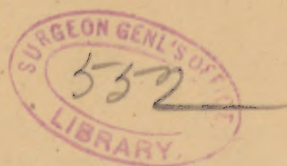


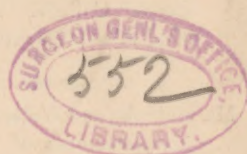
OTIS (Ed. O.)

Measurements of the Chest &c



MEASUREMENTS OF THE CHEST AND LUNG-CAPACITY.¹

BY EDWARD O. OTIS, M.D.



I PRESENT these measurements of the chest and lung-capacity as representing with a fair degree of accuracy the dimensions of the chest of an average man. I trust they will serve as reliable data in chest examinations. A comparison of my averages is given along with those of other examiners, and, as you see, they differ but slightly from one another. I know of no other published averages of the antero-posterior and lateral diameters of the chest with which to compare mine. The difference in these diameters in ordinary and deep inspiration is an important factor, it seems to me, in estimating the freedom and fulness of respiration.

My experience also convinces me that the measure of the so-called "complemental" air, the result of the difference between the "lung-capacity" and the amount of air exhaled after an ordinary quiet inspiration, is an important one in the study of the respiration of any individual, whether with or without diseased lungs. It is a significant fact that the amount of complemental air diminishes after practice in deep breathing, and this by the increase of both the factors involved in obtaining it, but more by the increase of the second factor, viz., the amount of air exhaled after an ordinary quiet inspiration. I am deeply convinced of the importance of measuring accurately in this way, with spirometer, calipers, and tape, the character of the respiration, as to the expansion and movement of the chest, as well as its freedom and fulness. This datum, added to that obtained from auscultation and percussion, gives us a pretty complete knowledge of the condition of the respiration and chest expansion.

Such an examination as I suggest is equally valuable as a prophylactic measure. I am constantly impressed with this, as well as the satisfactory results obtained from deep breathing and lung-expanding exercises.

¹ Read before the American Climatological Association, Philadelphia, May 27, 1893.

TABLE I.

<i>Chest Measurements.</i>			
Girth of Chest. Muscular.	Repose.	Inflated.	Difference.
<i>Men.</i>			
Average of Dr. E. O. Otis, one thousand measurements, between sixteen and forty years of age...	34.0 inches.	36.1 inches.	2.1 inches.
Average of Dr. Hitchcock, of Amherst College. Eight thousand measurements	34.6 inches.	36.5 inches.	1.9 inches.
Average of E. Hitchcock, Jr., of Cornell College. Fifteen thousand measurements.....	34.5 inches.	36.3 inches.	1.8 inches.
<i>Women.</i>			
Mt. Holyoke and Wellesley students. Measurements of Miss Wood and Dr. Mary Colton.....	29.5 inches.	31.5 inches.	2.0 inches.
Respiratory Chest.			
<i>Men.</i>			
Average of Dr. E. O. Otis. One thousand measurements.....	31.1 inches.	33.1 inches.	2.0 inches.
<i>Women.</i>			
Fifty per cent. of fifteen hundred Wellesley students. Miss Wood	24.6 inches.	27.2 inches.	2.6 inches.
Depth of Chest.			
<i>Men.</i>			
Average of Dr. E. O. Otis. One thousand measurements in repose and one hundred and twelve measurements inflated...	7.3 inches.	8.2 inches.	0.9 inch.
<i>Women.</i>			
Fifty per cent. of fifteen hundred students at Wellesley. Miss Wood	6.9 inches.		
Breadth of Chest.			
<i>Men.</i>			
Average of Dr. E. O. Otis. One hundred and fifty measurements	9.6 inches.	10.8 inches.	1.2 inches.

TABLE II.

Capacity of Lungs.

<i>Men.</i>	Cubic Inches.
Average of Dr. E. O. Otis. One thousand measurements.....	240.6
Hitchcock. Eight thousand measurements	230.0
Hitchcock, Jr. Fifteen thousand measurements.....	236.6

Women.

	Cubic Inches.
Mt. Holyoke and Wellesley students. Measurements of Miss Wood and Dr.	
Mary Colton	145.8
Fifty per cent. of fifteen hundred Wellesley students. Miss Wood.....	150.3

TABLE III.

Comparison of the "Vital" or Lung Capacity and the Amount of Air Expelled after an Ordinary Quiet Inspiration. Average of Dr. E. O. Otis. One Hundred and Fifty Measurements.

	Cubic Inches.
Vital capacity, or the amount of air exhaled after a full inspiration.....	230.5
Amount of air exhaled after an ordinary quiet respiration	129.3
Difference, or "complemental" or "reserve" air	101.2
Difference as given by Hermann	97.6

